

HEYBURN STATE PARK/ BENEWAH CAMPGROUND ROAD IMPROVEMENTS

FOR

IDAHO DEPARTMENT OF PARKS AND RECREATION

SUBMITTED TO IDAHO DEPARTMENT OF PARKS AND
RECREATION

APRIL 2009

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1. INTRODUCTION

1.1. PURPOSE

We understand the Idaho Parks and Recreation Department is planning to resurface or reconstruct the roadways in Heyburn State Park and the Benewah Campground. The purpose of this report is to assess the existing roadway conditions by performing a subsurface evaluation and noting the surface conditions. A review of the roadways that were reconstructed during the installation of the waterline will also be completed. From this information, improvement recommendations with opinions of probable cost and an implementation strategy for addressing near-term and long-term needs.

1.2. SCOPE OF WORK

The Idaho Parks and Recreation Department (IDPR) hired Welch Comer & Associates, Inc. to perform an assessment of the existing roadway structures and present the results in this report. The roadways for this project are identified on the Heyburn State Park and Benewah Campground Map.

The following encompasses the scope of the work:

- Field evaluation noting surface type, general surface and drainage conditions.
- Review information about roadwork completed during waterline project.
- Conduct 11 roadway corings to determine existing roadway section.
- Using available electronic data supplied by IDPR, map roadways according to existing surface material.
- Prepare recommendations for resurfacing or reconstruction options for the roadways.
- Estimate construction and life cycle costs associated with each roadway reconstruction and resurface option.

The following items were specifically excluded from this Scope of Work: pavement design, survey data collection, aerial mapping, and adequacy of the existing roadway drainage system.

2. EXISTING CONDITIONS EVALUATION

Heyburn State Park and Benewah Campground are open from May 1 to September 30 each year. The parks consist of three campgrounds, three day use areas and three boat launches. The campsites are utilized by tent campers, trailer campers and large recreational vehicles. Passenger vehicles and trucks towing trailers and boats cause wear and tear to the roadway surface. However, large recreational vehicles apply heavier load to the roadways and have the potential to cause damage.

2.1. TOPOGRAPHY

Heyburn State Park is located adjacent to Chatcolet Lake and Benewah Campground is located adjacent to Benewah Lake. Both Parks are surrounded by rolling hills that are well vegetated and forested. The sheet flow from the rolling hills flows across the roadways is towards Chatcolet Lake and Benewah Lake.

2.2. AVERAGE DAILY TRAFFIC (ADT) VOLUMES

The traffic in the Park consists of passenger cars and trucks, trailers, and recreational vehicles (RV). Traffic counts are completed at the entrance to Heyburn State Park and were supplied to Welch Comer & Associates, Inc. During the week of July 8, 2007 to July 14, 2007 approximately 3,141 vehicles crossed the traffic counters, which was approximately 450 vehicles per day. We estimate approximately 10 percent of the vehicles were large recreational vehicles since some of the campsites have hook up facilities. We estimate a growth in traffic of approximately three percent over the next 20 years.

Traffic for the individual campground roadways will be estimated by the number of campsites. Campsite information was supplied to Welch Comer & Associates, Inc. by the IDPR. For the purpose of this report, we will assume the campsites are full and each occupant leaves and returns to the campsite twice daily, so four trips per campsite per day. Ten vehicles per day will be used as the average daily traffic for the day use campsite.

Figure 2.1: Estimated Campsite Traffic

Campsite	Number of Camp Sites	ADT
Benewah Campground	39	156
Hawley's Landing	52	208
Plummer Creek (Day Use Only)	0	20
Rocky Point (Cabins)	80	320
Chatcolet Upper and Center (Cabins)	54	216
Lakeview Cottages	3	12

2.3. ROADWAY GEOMETRY

2.3.1. ROADWAY WIDTHS

The campground roads have an average width of 12-14 feet. Benewah Campground's main access road has a width of 18 to 14 feet. Chatcolet's main access road has an average width of 20 feet.

2.3.2. INTERSECTION CONFIGURATION

Some of the campground roads have poor sight distance for vehicles returning to the main access roads. Poor sight distance increases the potential for accidents if the vehicle entering the intersection can not see the on coming traffic. In order to improve safety within these intersections, sight design improvements need to be made to the intersections. Figure 2.2 contains a list of the intersections, which should be modified or improved.

Figure 2.2: Recommended Roadway Intersection Improvements

Roadway	Intersecting Road	Problem	Recommended Improvements
Plummer Point	Chatcolet	Grade of Plummer Point road, limited site distance.	Lower the elevation of Chatcolet Road to improve intersection site distance and slope of Plummer Point road.
Upper Chatcolet Road	Chatcolet	Turning radius for southern bound traffic on Chatcolet Road and traffic turning north onto Chatcolet Road.	Redesign the intersection to accommodate the traffic in both directions. This may require a grade change on both roads.
Rocky Point Boat Launch Road	State Highway 5	Site distance.	Redesign intersection to increase site distance.

2.3.3. DRAINAGE

Drainage issues are a major problem with roadway use, and can cause unsafe driving conditions, and rapidly deteriorate the conditions of roadway. The ability of a roadway's capability to quickly remove surface water from its pavement area is frequently a direct correlation to pavement longevity. During the fall, winter and spring the freeze/thaw conditions can cause swelling and/or settling of the roadway. The parks are open from May to September. Therefore, the park roads do not have traffic during the freeze/thaw months.

Some of the roadways within Heyburn State Park and Benewah Campground may have areas where water pools on the sides of the road, and in some cases, spills

over the top of the roadways. This may be a result of the shoulder being higher in elevation than the adjoining edge of the roadway or of the drainage ditches requiring maintenance. Standing water on pavement can contribute to accelerated pavement deterioration and potentially unsafe driving conditions. Drainage improvements, such as roadside swales with positive drainage outlets and/or properly-designed ground infiltration systems will greatly benefit existing roadway conditions, as well as extend the longevity of rehabilitated roadway.

Over the years, drainage ditches have a potential to accumulate soil that has been transported from the surrounding slopes. We recommend the drainage needs be improved by yearly maintenance to the existing drainage ditches.

2.4. ROADWAY SURFACES

The roadway surfaces consist of asphalt pavement or gravel and are depicted on the Heyburn State Park and Benewah Campground Roadway Map in the appendix. The existing asphalt surface was cored to assess the existing pavement section in some areas. Hand auguring was then completed to assess the thickness of the base course underlying the asphalt pavement. Hand auguring was also completed in the gravel surfaced road to assess the thickness of the gravel surface and the underlying subgrade.

2.4.1. ASPHALT SURFACED ROADWAYS

Paved roads experience surface cracks which require maintenance to protect the roadbed and underlying subgrade from weakening and causing fatigue in the overlying pavement. The coring results are presented in the following table and the coring locations are noted on the attached Coring Location Map in the Appendix.

Figure 2.3: Asphalt Coring Information.

Core Number	Asphalt Thickness (inches)	Base Thickness (inches)	Subgrade Soil
B1	1.75	1.25	Poorly-graded Gravel
B2	1.75	4.5	Topsoil with organics
H1	0.75	2.75	Silt with Cobbles
R1	2	4	Silt
C1	1.25	6.75	Poorly-graded Gravel
C3	5	5	Poorly-graded Gravel
C4	3.5	5.5 (oil-treated)	Poorly-graded Gravel
C5	1	5 (oil-treated)	Poorly-graded Gravel

2.4.2. GRAVEL SURFACED ROADWAYS

Unpaved roads may experience loss of gravel or poor drainage. Both of these conditions may lead to a weakened subgrade which may result in ruts and potholes in the roadway. Maintenance is required to establish a good crown and an adequate layer of gravel. The coring results for the gravel roads are presented in the following table and the coring locations are noted on the attached coring location Map in the Appendix.

Figure 2.4: Gravel Coring Information

Core Number	Gravel Thickness (inches)	Subgrade Soil
B3	7	Silt
H2	9	Sandy Silt
C2	4.5	Poorly-graded Gravel

2.4.3. SUBGRADE SOIL

The subgrade soil is the underlying strength of a pavement section. If the subgrade becomes weakened then the overlying pavement section starts to show signs of fatigue. The roadways appear to be underlain by silt or poorly-graded gravel. A sample of the silt soil was obtained for laboratory testing. An Atterberg test was completed to assess the plasticity of the silt soil and the test results indicate the soil is low plasticity. A California Bearing Ratio (CBR) test was completed to assess the strength of the on-site soil to support a pavement structure. The CBR test analyzes the strength by comparing the penetration resistance of the on-site soil to the penetration resistance of standard crushed rock. The CBR test result for the low-plasticity silt is 5.7 percent. The test results are located in the Appendix.

2.5. **PAVEMENT SURFACE EVALUATION AND RATING (PASER)**

To assist the Idaho Department of Parks and Recreation in establishing a roadway surface management system, the existing roadways were rated according to the PASER system for gravel surfaced and asphalt paved roads. The PASER Manuals were developed by the Transportation Information Center of the University of Wisconsin-Madison. The pavement rating system, described in the PASER Manuals, rates roadway surfaces on the amount, size, and direction of cracks, potholes, and deformities located in the roadway surface.

Based upon the type and extent of defect or deformation observed, the PASER rating system provides the opportunity to complete an objective assessment along with standard rehabilitation treatments for addressing each noted condition(s).

2.5.1. ASPHALT SURFACED ROADWAYS

The access roads are surfaced with asphalt. The asphalt PASER system is based upon a rating scale of 1 to 10, with 1 being a road with severe distress and extensive loss of surface integrity which requires substantial rehabilitation and/or reconstruction, and 10 being a road with no visible distress.

In general, there are four major categories of common asphalt pavement surface distress:

- Surface defects, including raveling, flushing, and polishing
- Surface deformation, including rutting, distortion-rippling and shoving, settling, and frost heave
- Cracks, including transverse, reflection, slippage, longitudinal, block, and alligator cracks
- Patches and potholes

The following list is a summary of the PASER Ratings applied to paved roadways:

- Rating 10: Excellent- newly constructed roadway (no maintenance required)
- Rating 9: Excellent- recently overlaid roadway (no maintenance required)
- Rating 8: Very Good- few longitudinal/transverse cracks tightly sealed (little to no maintenance required)
- Rating 7: Good- slight raveling and longitudinal/transverse cracks $\geq 10'$ spacing (routine sealing recommended)
- Rating 6: Good- slight surface raveling, transverse cracks $\leq 10'$ spacing open up to $\frac{1}{2}$ ", early block cracking (consider preservative treatment)
- Rating 5: Fair- moderate to severe surface raveling w/ loss of aggregate, longitudinal cracks near edge, block cracking up to 50% of surface, severe flushing and polishing (preservative maintenance and seal coat required)
- Rating 4: Fair- severe raveling, longitudinal cracks in wheel path, raveled transverse cracking, over 50% of surface has block cracking, slight rutting in wheel path, extensive patching (Structural overlay required)
- Rating 3: Poor- extensive cracking, 2" ruts, open and raveled block cracking, first signs of alligator cracks, patches in poor condition (2" structural overlay required, with optional milling and pavement patching beforehand)
- Rating 2: Very Poor- extensive alligator cracks, needs drainage improvements, distorted patches, severe rutting, some potholes and pavement pulverization (reconstruction of roadway)

- Rating 1: Failed- severe distress and extensive loss of surface integrity with frost and drainage damage (reconstruction of roadway, with possible drainage and sub-base improvements)

The Roadway Improvement Recommendations section of this report presents the PASER rating for each roadway and the recommended associated pavement condition. Future analysis of these roadways can be compared against these PASER Ratings taken in July, 2008.

2.5.2. GRAVEL SURFACED ROADWAYS

The roadways adjacent to the campgrounds are surfaced with gravel. Ratings from 1 to 5 are used by the gravel PASER rating system assess the conditions of the gravel roadways. A rating of 1 indicates poor drainage with severe rutting and potholes and loss of aggregate surfacing, where a rating of 5 indicates no visible distress, a crown is present to facilitate drainage, and there is no dust from traffic.

The most important factors, in evaluating a gravel road, are the cross section, drainage, and adequacy of the gravel layer. Water is directed off of the roadway surface and to the drainage ditches by sloping the roadway. Lack of drainage or gravel may be indicated by visible surface damage, such as ruts and potholes. Dust and loose aggregate can affect the safety of the roadway.

The following list is a summary of the PASER Ratings applied to gravel roadways:

- Rating 5: New Construction- or total reconstruction. Dust controlled. Excellent surface condition and ride. .
- Rating 4: Good crown and drainage throughout. Dust under dry conditions. Slight washboarding.
- Rating 3: Good crown (3" to 6"). Additional aggregate required for stability. Some isolated potholes and ruts. Additional gravel needed in some areas.
- Rating 2: Little or no crown (less than 3"). Drainage ditches need maintenance. Rutting is 1" to 3" deep. Moderate potholes are 2: to 4" deep.
- Rating 1: No roadway crown. Extensive ponding. Severe potholes (over 4" deep). Little or no aggregate.

The Roadway Improvement Recommendations section of this report presents the PASER rating for each roadway and the recommended associated maintenance. Future analysis of these roadways can be compared against these PASER Ratings taken in July, 2008.

2.6. ROADWAY IMPROVEMENT INFORMATION

A few of the intersections should be redesigned for safety reasons. The American Association of Highway and Transportation Officials (AASHTO) has established roadway design guidelines for low-volume roads. Some of the intersections in the park system do not provide adequate sight distances or turn radii according to AASHTO requirements. Appropriate intersection design is important in reducing the potential for vehicle accidents. The intersections requiring changes are discussed in Section 3 of this report and an estimate for the design and construction costs is presented in the Appendix.

After reviewing the surface of the roadways and coring the roadways to observe the existing pavement section, the improvement recommendations vary from reconstruction to dust and soil stabilization. The estimated costs, for these improvements, are included in the Appendix.

- Reconstruction consists of removing the current roadway, designing a roadway profile and reconstructing the roadway with base and asphalt surfacing.
- If the existing base rock on the roadway is adequate then asphalt overlay is recommended. An asphalt overlay requires some minor grading of the existing base rock before placing and compacting the asphalt surfacing.
- A chip seal is used for maintenance and should increase the life of the existing pavement surface by revitalizing the wearing course. A chip seal entails the placing of aggregate with two shots of bituminous oil.
- Dust and soil stabilization agent is used on the gravel roads. This process requires some grading of the roadway and then the application of the product. The product that we recommend is manufactured by Tomorrow. The product penetrates and extends down into the surface to create a tough layer of protection. The product does not leach or track and easily mixes with water so it is safe to use in the vicinity of the lake.

2.7. PAVEMENT MAINTENANCE PLAN

Analysis of the streets should be performed once every two to three years, to monitor the surface conditions and reevaluate where roadway improvements are needed.

Roadways which received a moderate rating on the PASER Ratings Scale should be repaired within the next two to three years to improve safety, mobility, and the aesthetics of the roadway. Extended neglect to roadways which received low PASER ratings will result in further deterioration of the roadway, and ultimately increase the costs of repair.

Roadways which received a high PASER rating, should be monitored every two to three years, and compared to their original PASER Rating. Patching cracks and applying seal coats to the asphalt roadways, when needed, will increase their lifespan. Regrading and applying a stabilization agent to the gravel roadways will decrease the potential for surface distress and loss of aggregate.

Reconstructed roadways and roadways currently in good condition should be assessed within 5-years, to evaluate how vehicle traffic is affecting the condition of the roadways. These roadways should be monitored periodically, to confirm that problems with drainage or sub-grade failure will not occur, and cause the rapid deterioration of these roadways.

3. ROADWAY IMPROVEMENT RECOMMENDATIONS

3.1. GOALS AND OBJECTIVES

The goal for the recommended improvements is to develop a budget for rehabilitation and maintenance of the roadways, while improving the safety throughout the Heyburn State Park and Benewah Campground.

3.1.1. RECOMMENDATIONS FOR INTERSECTION REDESIGN

3.1.1.1. INTERSECTION OF CHATCOLET ROAD AND UPPER CHATCOLET ROAD

Problems:

The intersection has two access points from Chatcolet Road to Upper Chatcolet Road. The main access point was constructed when the road was constructed and is shown in Figure 3.1. Neither access intersects Chatcolet Road at right angles which limits the site distance of a vehicle on Chatcolet Upper Road. Also the grade of the approaches is very steep which makes it difficult for a vehicle to start moving and enter the traffic on Chatcolet Road. Some of the vehicles at this intersection are towing a boat or trailer which limits the speed of the vehicle entering the intersection.

The existing alignment also causes clearance problems for vehicles turning from one road onto the other. Drivers created a second access to accommodate the clearance problems and the second access is shown in Figure 3.1 and 3.2. The grade of the second access is very steep with limited site distance at the intersection.

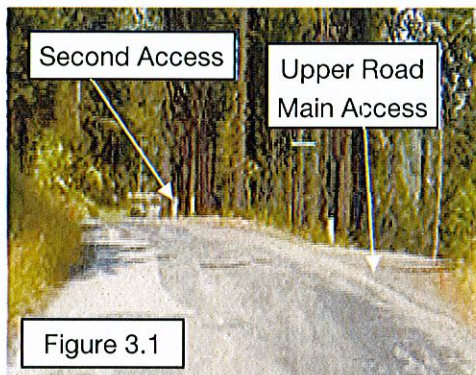


Figure 3.1



Figure 3.2

Proposed Solution:

1. The intersection should be redesigned so the centerlines intersect at right angles. The realignment will have the following advantages:
 - Increase the site distance for vehicles entering the intersection.
 - Provides increased turning area for vehicles towing a trailer or boat to maneuver the intersection for turns.
2. The first 20 feet of the approach on Upper Chatcolet Road should be graded to a maximum slope of two percent. The advantages of a level approach are as follows:
 - The vehicles on Chatcolet Road will see a

vehicle is approaching the intersection on Upper Chatcolet Road.

- Provides a level stopping area for the approaching vehicle.

3.1.1.2. INTERSECTION OF CHATCOLET ROAD AND PLUMMER POINT ROAD

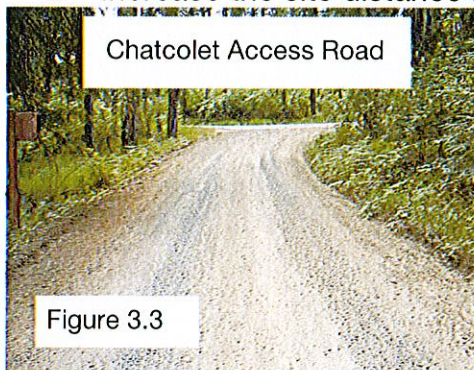
Problems:

Plummer Road is used to access a day use picnic area and is shown in Figure 3.3. The grade of Plummer Point Road is relatively steep at the intersection. Therefore, vehicles need to accelerate as they approach the intersection and then decelerate at the intersection. The gravel surface and steep grade makes it difficult for vehicles to decelerate at the intersection.

Proposed Solution:

1. The intersection should be redesigned so the centerlines intersect at right angles. The realignment will have the following advantages:

- Increase the site distance for vehicles entering the intersection.



2. The first 20 feet of the approach on Plummer Point Road should be graded to a maximum slope of two percent. The advantages of a level approach are as follows:

- The vehicles on Chatcolet Road will see a vehicle is approaching the intersection.
- Provides a level stopping area for the approaching vehicle.

3.1.1.3. INTERSECTION OF STATE HIGHWAY 5 AND ROCKY POINT ROAD

Problems:

Figure 3.4 is Rocky Point Road with State Highway 5 in the distance. Figure 3.5 is the same intersection but from the perspective of State Highway 5. The site distance for vehicles leaving Rocky Point Road is limited due to the configuration



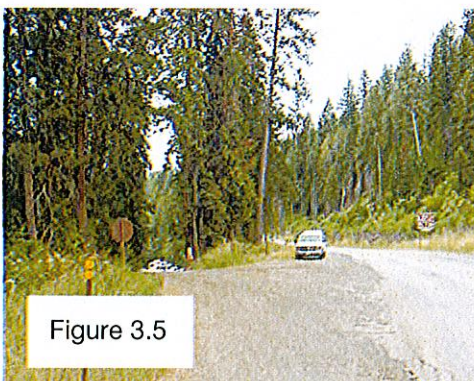
of the intersection.

Vehicles that are towing a boat have a tight turn radius in order to turn from State Highway 5 onto Rocky Point Road as can be seen in Figure 3.5.

Proposed Solution:

1. Realign Rocky Point Road so that it intersects State Highway 5 at right angles. The realignment will have the following advantages:

- Increase the site distance for vehicles



entering the intersection

- Provides increased turning area for vehicles towing a trailer or boat to maneuver from State Highway 5 to Rocky Point Road.

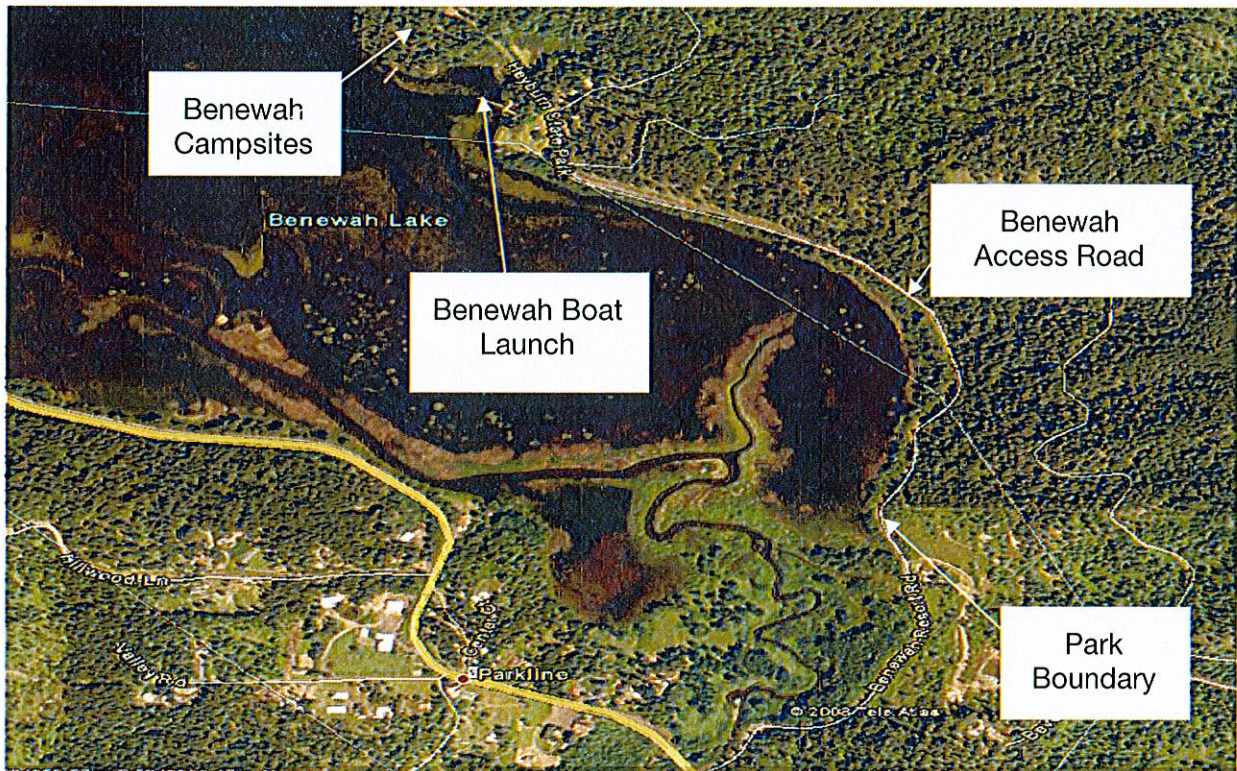
3.1.2. ROADWAY PAVEMENT IMPROVEMENT RECOMMENDATIONS

The PASER rating index indicates the condition of the roadway. The roadway sections which possess the lowest PASER rating pose the greatest probability for continued decline. Section 3.3 presents a summary of the engineer's recommendations for street rehabilitation and a possible phasing scenario. The possible phasing is dependent upon funding availability.

3.1.2.1. BENEWAH CAMPGROUND

Benewah Campground has three campground roads that service 39 campsites, see Figure 3.7.

Figure 3.7: Benewah Campground Roads





3.1.2.2. BENEWAH CAMPGROUND ROAD

Recreational vehicles as well as passenger cars and trucks use the campsite roadways. Figure 3.8 presents the existing roadway information.

Figure 3-8: Benewah Campground Roadway Information

Length of Roadway (feet)	Width of Roadway (feet)	Existing Pavement Surface	PASER Rating	Surface Pavement Conditions
1,627	12	Gravel	3	No dust control, grading required for drainage, no drainage ditches.

Soil sampling was completed by hand auguring the existing roadway. The gravel surfacing contained approximately 20 percent silt 30 percent sand and 50 percent gravel and was approximately 7 inches deep. The gravel soil was underlain by native silt soil.

The existing roadway will require regrading before any dust control is applied. Potholes on the roadway are only minor. Regrading of the roadway should eliminate the existing potholes. We recommend the roadway be treated with a dust erosion and soil stabilization control agent. At this time, it is not necessary to add any additional gravel. The figure 3.9 summarizes the estimated cost for the recommended work.

Figure 3.9: Benewah Campground Road Estimated Construction Costs

Roadway	Length of Roadway (feet)	Surfacing	Cost per 100 Lineal Foot	Total Cost
Benewah Campground	1,627	Gravel	\$1,871	\$30,441

3.1.2.3. BENEWAH ACCESS ROAD

The access road for Benewah Campground intersects with State Highway 5 and ends at the campground sites. Approximately, the first half-mile of the roadway, from State Highway 5 to the park boundary, is maintained by Benewah County. The IDPR is to maintain the last 4,400 feet of roadway, which is between the park boundary and the campground. The Benewah County portion of the roadway and is not included in this analysis. Figure 3.10 presents the existing roadway information.

Figure 3.10: Benewah Access Road Information

Length of Roadway (feet)	Width of Roadway (feet)	Existing Pavement Surface	PASER Rating	Surface Pavement Conditions
4,400	18 to 14	Asphalt	2	Pot holes, Rutting, Alligator Cracking, improve drainage ditches, pavement marking is worn.



The existing asphalt was cored in two locations and the base material was hand augered. The coring locations are indicated on the Coring Location Map in the Appendix of this report.

The asphalt core from coring B1 is shown on the left. The thickness of the asphalt was approximately 1¾ inches and the asphalt was underlain by 1½ inches of base rock. The subgrade soil consisted of poorly-graded gravel and the largest nominal size of gravel was approximately 2 inches.



The core B2 consisted of approximately ¾ inches of hot mix asphalt which was underlain by approximately 1 inch of a chip seal material. The hot mix layer and chip seal layer are apparent in the picture of the core. Base course was encountered under the asphalt and was approximately 5 ½ inches thick. Topsoil with organics was encountered to approximately 14 inches below the pavement surface. The depth of the topsoil may be deeper but we were unable to advance the hand auger any further due to the size of the cobbles that were encountered.

We recommend this roadway be reconstructed due to the topsoil and the inadequate base course. The topsoil beneath the pavement should be removed. The roadway should then be regraded to facilitate drainage. The traffic on the access

roadway supports vehicles visiting the campgrounds and utilizing the boat launch and parking area. Therefore, the traffic is relatively light. The new pavement section should consist of 3 inches of asphalt surfacing underlain by 6 inches of crushed base course and filter fabric.

Figure 3.11: Benewah Access Road Estimated Construction Costs

Roadway	Length of Roadway	Surfacing	Cost per 100 Lineal Feet	Total Cost
Benewah Access Road	4,400	Asphalt	\$10,323	\$454,212

3.1.2.4. ROCKY POINT ROAD

Rocky Point has four roads that intersect with State Highway 5. A campground, day use area and boat launch is located adjacent to the Rocky Point Lodge. The upper and loop roads access year round cabins. So the traffic on these roads primarily consists of passenger vehicles. Figure 3.12 presents the existing roadway information and Figure 3.13 is an overview of the roadway service area.

Figure 3.12: Rocky Point Road Information

Roadway Name	Length of Roadway (feet)	Width of Roadway (feet)	Existing Pavement Surface	PASER Rating	Surface Pavement Conditions
Rocky Point Upper Road	792	14	Gravel	5	Road was reconstructed when the water line construction was completed.
Rocky Point Loop Road	3330	14	Gravel with patches of asphalt	2	No visible crown in the road way. Visible moderate rutting. Some potholes. Waterline was constructed in some areas.
Rock Point Lodge Access Road	580	14	Gravel	2	No visible crown in the road way. Visible moderate rutting. Some potholes.
Rock Point Lodge Parking	70	14	Gravel	2	No visible crown in the road way. Visible moderate rutting. Some potholes.
Boat Launch Access Road	1220	14	Gravel with patches of asphalt	2	Slope into boat launch area is too steep. Asphalt had deteriorated over most of the roadway.
Rocky Point Lane	375	14	Gravel	3	Good crown with slight washboarding. Isolated potholes.

Figure 3.13: Rocky Point Overview



This core sample was obtained on the boat launch access road. It appears that two chip seal layers were applied to the roadway. The upper layer contained more fine-grained aggregate. The asphalt core is approximately 2 inches thick. So both chip seals were approximately 1 inch in thickness. The asphalt was underlain by 6 inches of base rock and the subgrade soil consisted of silt soil.



There are many different roads in this section of the park.

- There are cabins along the upper Road and the cabins can be accessed all year as a result the upper road should be paved with an asphalt surface. Base rock and fabric were placed on the roadways after construction of the waterline. The base rock should be graded and then paved. New base rock is not necessary at this time. However, if the roadway is not paved for a few years additional base rock may be necessary. The price below includes no additional base rock.
- The asphalt is not consistent along the length of the loop roadway. Waterline was placed in some areas of this roadway. We recommend the roadway be reconstructed so that fabric and base rock is consistent along the full length of the roadway. The roadway should then be paved with 3 inches of asphalt underlain by 6 inches of base rock.
- The parking area for Rocky Point Lodge does not require pavement. The existing roadway will require regrading before any dust control is applied. Potholes on the roadway are only minor. Regrading of the roadway should eliminate the existing potholes. We recommend the roadway be treated yearly with a dust erosion and soil stabilization control agent.
- Due to the amount of vehicles accessing the boat launch, the boat launch road should be asphalted. The road will need to be graded. Base rock and asphalt will need to be placed. We recommend 3 inches of asphalt over 6 inches of base rock.
- Rocky Point Lane is used to access approximately 5 cabins. This roadway was reconstructed during the installation of the waterline. To protect the base rock that was placed we recommend the roadway be paved with 3 inches of asphalt.

Figure 3.14: Rocky Point Estimated Construction Costs

Road	Length	Surfacing	Cost per 100 Lineal Foot	Total Cost
Rocky Point Upper Road	792	Asphalt	\$7,233	\$57,285
Rocky Point Loop Road	3330	Asphalt	\$10,323	\$343,756
Rocky Point Lodge Access Road	580	Gravel	\$1,871	\$10,852
Rock Point Lodge Parking	200	Gravel	\$1,871	\$3,742
Boat Launch Access Road	1220	Asphalt	10,232	\$124,830
Rocky Point Lane	375	Gravel	\$7,223	\$27,087

3.1.2.5. HAWLEY'S LANDING CAMPGROUND

Hawley's Landing is located just west of the Chatcolet access road. An RV station is located adjacent to the access road. The campsites consist of hook up sites and tent sites. So the traffic will consist of passenger vehicles and RV vehicles. Figure

3.14 presents the existing roadway information and Figure 3.15 is an overview of the roadway service area.

Figure 3.14: Hawley's Landing Campground Roadway Information

Roadway Name	Length of Roadway (feet)	Width of Roadway (feet)	Existing Pavement Surface	PASER Rating	Surface Pavement Conditions
Entrance Road	500	14	Asphalt	8	No visible surface cracks or potholes.
RV Dumping Station	200	14	Gravel	3	Minor rutting and potholes.
Campground Roads	845	14	Gravel	4	Some regrading required for drainage. No visible rutting or potholes.
Lakeview Cottage Road	1005	12	Gravel	3	Some potholes, rutting, no dust control, regrading required for drainage.

Figure 3.15: Hawley's Landing Campground Overview





The core was taken from the access road. It appears the asphalt surfacing is a chip seal and is approximately 0.75 inches thick. A 3½ inch layer of base course underlies the chip seal. The subgrade is silt soil.

We understand the entrance road will be used for large RVs and trailers to access the RV dumping station. Therefore, the surfacing on the roadway needs to be designed to withstand the weight of

these vehicles and the turning that will be required for the vehicles to access the dumping station.

We recommend the entrance and the RV Dump Station be surfaced with hot mix asphalt. Additional base course will also be required. We recommend the roadway and the RV dump site be reconstructed and paved with 3 inches of asphalt underlain by 12 inches of base rock.

The campground roads can remain as gravel surfaced roadways. The existing roadway will require regrading before any dust control is applied. Potholes on the roadway are only minor. Regrading of the roadway should eliminate the existing potholes. We recommend the roadway be treated with a dust erosion and soil stabilization control agent. At this time, it is not necessary to add any additional gravel.

Figure 3.16: Hawley's Landing Campground Estimated Construction Costs

Roadway	Length of Roadway (feet)	Surfacing	Cost per 100 Lineal Foot	Total Cost
Entrance Road	500	Asphalt	\$16,183	\$80,915
RV Dump Station	200	Asphalt	\$16,183	\$32,366
Campsite Roadways	845	Gravel	\$1,871	\$15,810
Lake View Cottage Road	1005	Gravel	\$1,871	\$18,804

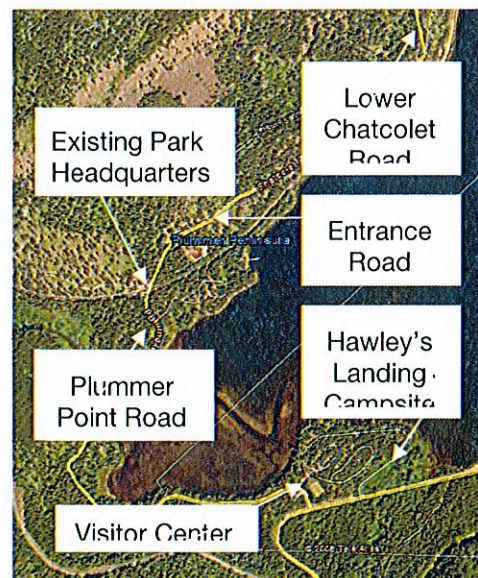
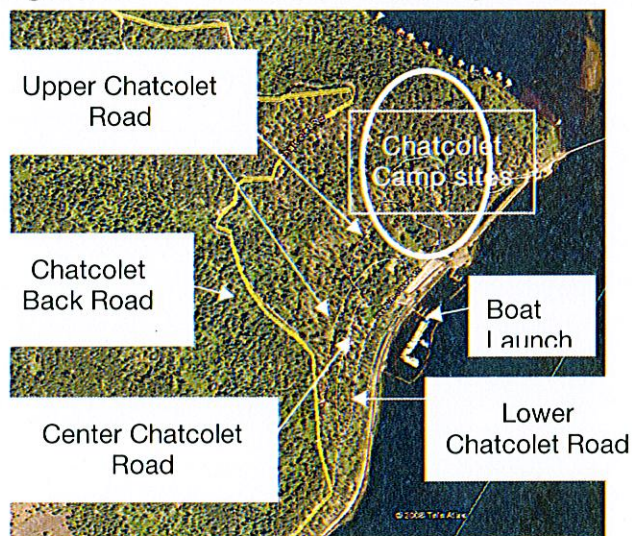
3.1.2.6. CHATCOLET ROAD

Chatcolet Road is the access road for the new visitor center, a boat launch, one campground area, a day use area and year round cabins. The campsite has hookup so the road will be utilized by passenger vehicles and RVs. Passenger vehicles towing boats also utilize the roadways. The roadway is plowed during the winter so this limits the traffic utilizing the year round cabins. Figure 3.17 presents the Chatcolet Roadway Information and Figure 3.18 presents an overview of the Chatcolet Road Area.

Figure 3.17: Chatcolet Roadway Information

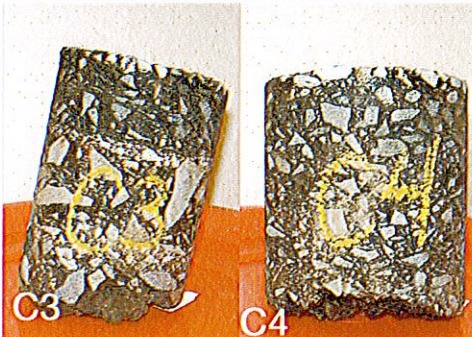
Roadway Name	Length of Roadway (feet)	Width of Roadway (feet)	Existing Pavement Surface	PASER Rating	Surface Pavement Conditions
Entrance Road (not including Visitor Center area)	10,560	20	Asphalt	8	Pavement striping is worn, slight raveling of surface material in some areas, dark areas indicated that asphalt has worked to the surface.
Visitor Center Area	Unknown	20	Asphalt	10	Newly constructed
Center Road	1220	14	Gravel	3	Reconstructed when the water line was placed.
Upper Road	5125	20	Gravel	3	Some rutting and washboarding are visible.
Lower Road	3300	20	Asphalt	8 and becomes 2 after boat launch	Boat launch to Chatcolet Road asphalt shows little wear. From the boat launch to the campground road asphalt has deteriorated.
Back Road	7,920	20	Asphalt	7	Very slight raveling, surface shows some traffic wear.
Campground	2,420	14	Gravel	3	Some rutting and washboarding are visible.

Figure 3.18: Chatcolet Roadway Overview





The first core was located just south of the bike trail on Chatcolet Road. The asphalt thickness was approximately 1 1/4 inch and was underlain by 8 inches of base rock.



The next core, C3, was located on the lower Chatcolet road. The asphalt thickness was a total of 5 inches and consisted of a 1 1/2-inch overlay of 3/4-inch-class hot mix asphalt underlain by 3-inches of 1 1/2-inch-class hot mix asphalt which was underlain by a chip seal. Approximately, 1 inch of the chip seal is visible in the left side of the core picture and the rest of the chip seal came out in pieces. The total chip seal was approximately 2 inches thick. The asphalt was underlain by 5 inches of base rock.



The next core, C4, was located on Chatcolet road. The core thickness is about 3 1/2 inches of hot mix asphalt and was underlain by 8 inches of oil-treated base rock. The oil-treated rock consisted of highly-fractured coarse gravel. Cobbles were encountered beneath the base course and so the hand auger could not be advanced.

Core, C5, was located on Chatcolet Road. The core was approximately 1 inch thick and was underlain by approximately 4 inches of oil-treated base rock. Protruding rocks from the asphalt surface indicates wear. The oil-treated base was underlain by cobbles so the hand auger could not be advanced.

There are many roads in the Chatcolet area. Each road is described below:

- Chatcolet Road from the new visitor center to approximately 500 feet north of the existing park headquarters has approximately 1 to 1.25 inches of asphalt. The roadway should be reconstructed to 3 inches of asphalt underlain by 12 inches of base rock.
- From 500 feet north of the existing park headquarters to the lower Chatcolet road the asphalt thickness increases to 3 to 5 inches. The thickness of the existing asphalt is adequate. At this time we do not recommend any reconstruction on this portion of the roadway. However, the roadway should be sealed to prevent water from affecting the subgrade.

- The center road was reconstructed with the construction of the waterline. We recommend this road be paved to protect the base course. New base rock may need to be added if road is not paved for a while.
- The upper road intersects with the lower road and then diverges towards the campground sites. The upper road also intersects with Chatcolet. The intersection of this roadway with Chatcolet was discussed previously and the roadway will be paved with the reconstruction of the intersection. The other segment of roadway accesses cabins and a campground. We recommend this portion of roadway be reconstructed and paved with 3 inches of asphalt over 12 inches of base. .
- The lower road has thick asphalt from Chatcolet road to the boat launch. Past the boat launch the asphalt had deteriorated. We recommend the northern end be reconstructed with 3 inches of asphalt over 12 inches of base.
- The back road is located from the lower Chatcolet road to the Park Boundary. The back road shows some signs of wear. We recommend a chip seal be placed on this road. There are also two cattle guards in the roadway that are no longer required. We recommend these be removed and the resulting ditch be backfilled.

Figure 3.19: Chatcolet Estimated Construction Costs

Roadway	Length of Roadway (feet)	Surfacing	Cost per 100 Lineal Foot	Total Cost
Access Road- Visitor Center to 500 feet north of Park Headquarters	5,280	Asphalt	\$16,183	\$854,462
Access Road- 500 feet north of Park Headquarters to Lower Road	5,280	Asphalt	No Repair Required	0
Center Road	1220	Asphalt	\$7,233	\$88,242
Northern Upper Road	2600	Gravel	\$16,183	\$420,758
Northern Lower Road	1300	Gravel	\$16,183	\$210,379
Back Road	7,920	Asphalt	\$2,653	\$210,118
Campground	2,420	Gravel	\$1,871	\$45,278

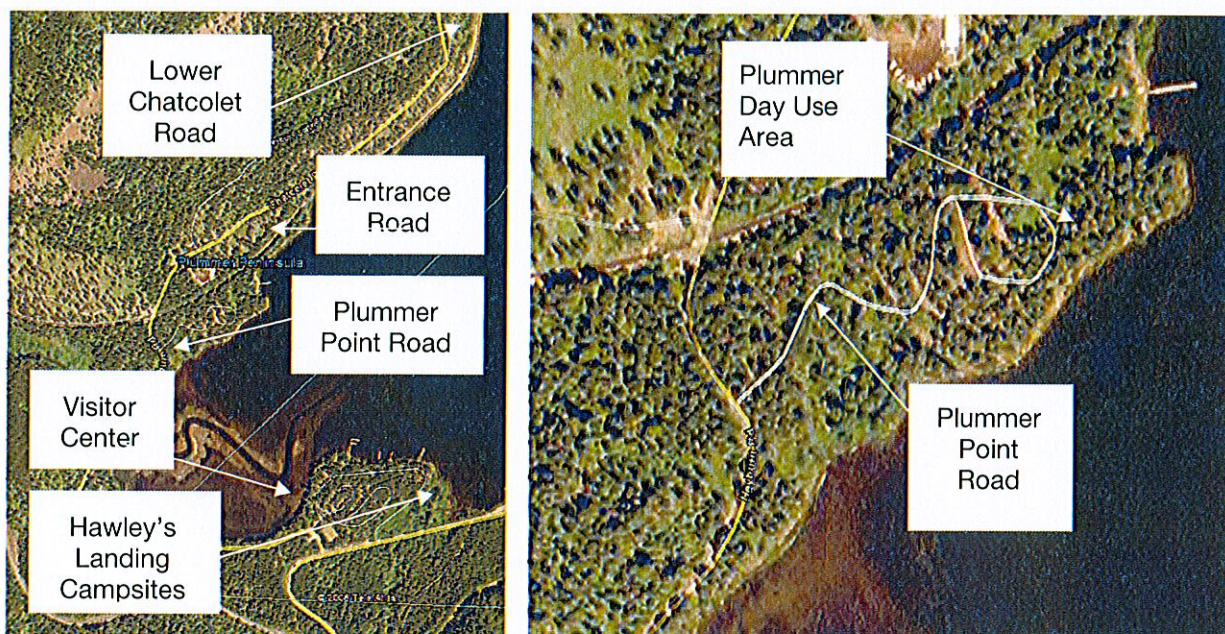
3.1.2.7. PLUMMER POINT DAY USE ACCESS ROAD

Plummer Point is used for picnics. No camping is permitted at this location. Therefore, the vehicle traffic accessing this area will probably be passenger vehicles.

Figure 3.20: Plummer Point Day Use Access Road Information

Roadway Name	Length of Roadway (feet)	Width of Roadway (feet)	Existing Pavement Surface	PASER Rating	Surface Pavement Conditions
Plummer Point	1,930	20	Gravel	4	Road is in relatively good condition. Slope for drainage is adequate.

Figure 3.21: Plummer Point Day Use Access Road Overview



A test pit was completed on the roadway. It appears there is approximately 4.5 inches of gravel on the roadway which is underlain by poorly graded gravel. The road should be shaped and stabilized for dust control.

Figure 3.22: Plummer Point Day Use Access Road Construction Costs

Roadway	Length of Roadway (feet)	Surfacing	Cost per 100 Lineal Foot	Total Cost
Plummer Point	1,627	Gravel	\$1,871	\$30,442

3.1.3. ROADWAY IMPROVEMENT RECOMMENDATIONS

The recommendations of Welch Comer & Associates, Inc. are to address the roadway intersection problems first and then the roadways which possess the lowest PASER rating index, as these roadways pose the greatest probability for continued decline. Figure 3-6 presents a summary of the engineer's recommendations for street

rehabilitation and a possible phasing scenario. The possible phasing is dependent upon funding availability.

A few of the roadways need rehabilitation but most of the roadways simply need some dust control maintenance. Benewah Access Road and the northern segment of the lower Chatcolet road received a PASER rating of 2, which indicates that they each possess the greatest need of rehabilitation. Most of the gravel roadways received a PASER rating of 2 or 3 which indicates some maintenance needed but no reconstruction is recommended.

The purpose of the PASER rating system is to determine a phasing assignment for incorporating rehabilitation treatment measures. Roadway maintenance should be considered an on-going process regardless of the pavement conditions

Once an allotted budget is established, whether annually or on a project-by-project arrangement, it is recommended that the Idaho Department of Parks and Recreation hire a professional engineer to prepare construction contract documents which would allow for the solicitation of competitive bid proposals for street rehabilitation efforts. Street rehabilitation efforts should be completed in the presence of a representative of a qualified engineer to ensure a quality product is provided.

The PASER rating system, outlined in Section 2.5 of this report and shows the current pavement ratings, should be used as a guideline in annual evaluations so that an individual roadway's rate of deterioration can be assessed. Periodic inspection is necessary to provide current and useful evaluation data. It is recommended that PASER ratings be updated every two years, at a minimum.

3.2. PRIORITIZING ROADWAY IMPROVEMENTS

The priority of roadway improvements will focus on increasing safety within Park's roadway system. These improvements should be implemented first to reduce the potential for accidents occurring at certain intersections.

3.3. CAPITAL IMPROVEMENT PLAN (CIP)

Figure 3.23: Heyburn State Park and Benewah Campground Capital Improvement Plan Phase 1

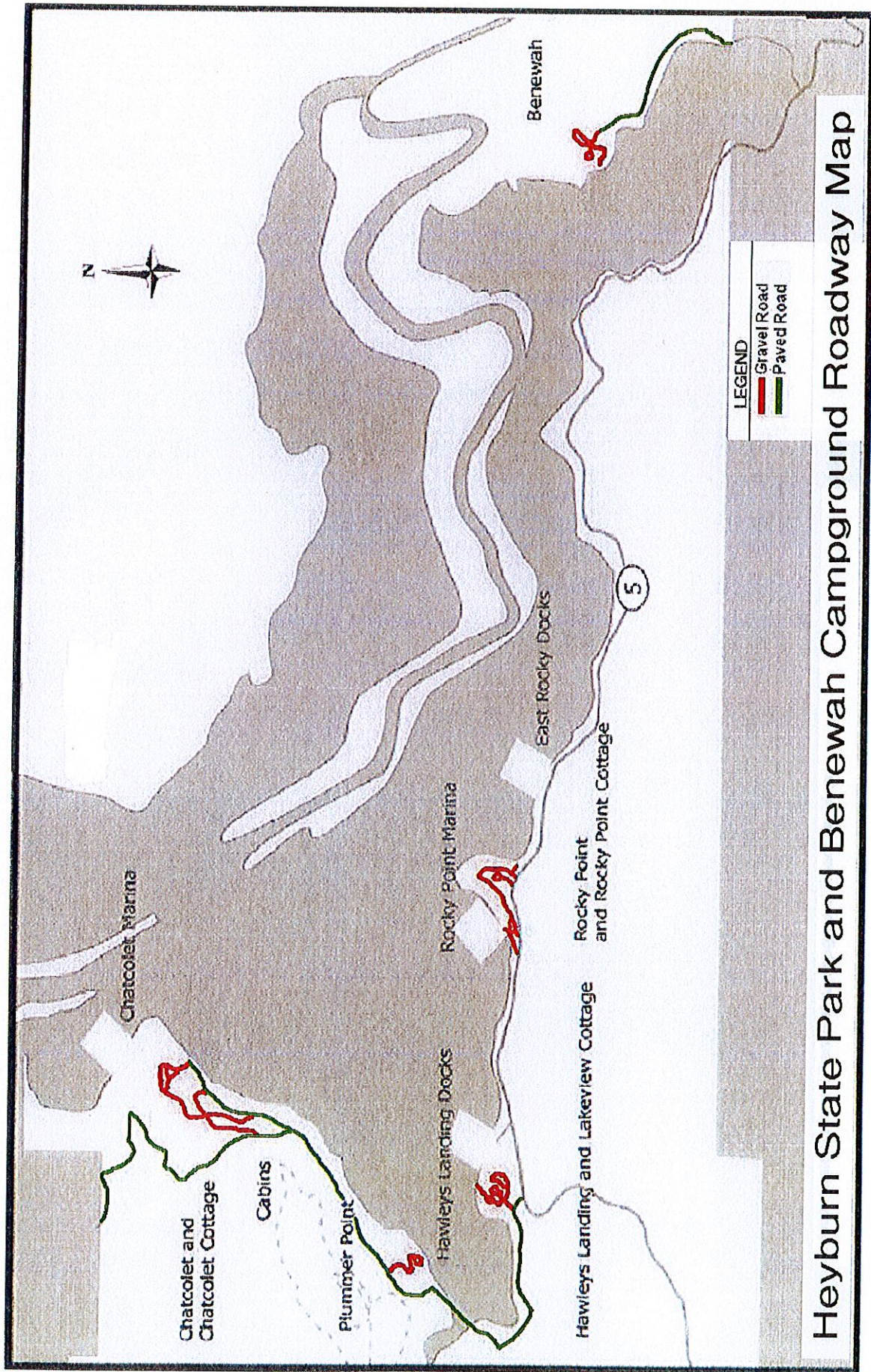
Heyburn State Park and Benewah Campground Roadway Reconstruction and Maintenance Capital Improvement Plan Phase I		
Project	Description	Estimated Project Cost
<i>For Safety Reasons, The Following Should be Completed First.</i>		
Intersection Improvements		
	Chatcolet and Upper Chatcolet	\$148,780
	Chatcolet and Plummer Point	\$92,072
	Rocky Point and SH-5	\$141,164
Subtotal Phase I		382,016

Figure 3.24: Heyburn State Park and Benewah Campground Capital Improvement Plan Phase II

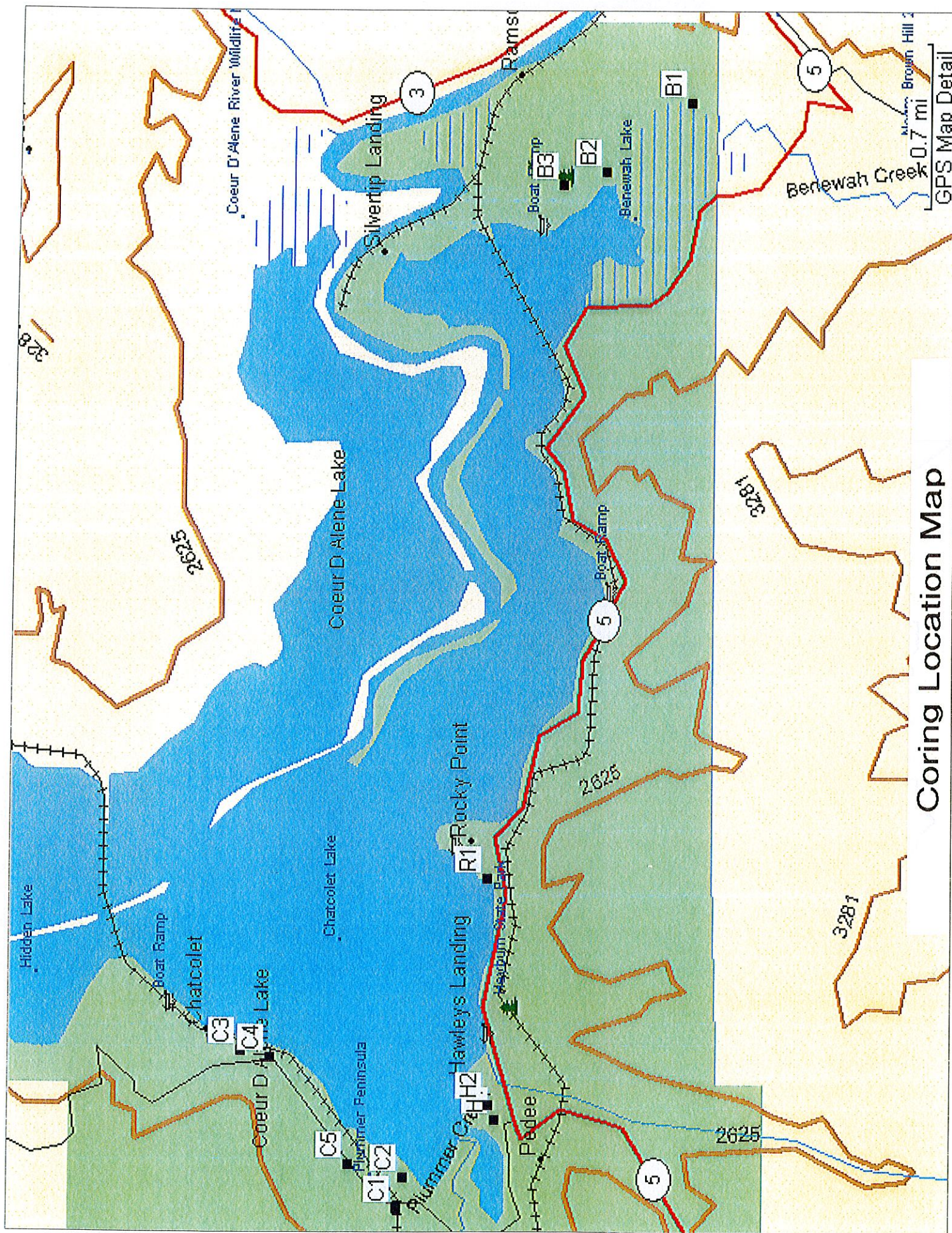
Heyburn State Park and Benewah Campground Roadway Reconstruction and Maintenance Capital Improvement Plan Phase II		
Project	Description	Estimated Project Cost
Pavement Section Reconstruction		
	Benewah Access Road	\$454,212
	Northern Lower Chatcolet Road	\$210,379
<i>We Recommend the Following as Budget Allows</i>		
Asphalt Pavement Only (base rock in place)		
	Rocky Point Upper	\$57,285
	Rocky Point Lane	\$27,087
	Chatcolet Center	\$88,242
Full Reconstruction		
	Rocky Point Loop	\$343,756
	Hawley Entrance and RV Waste Station	\$113,281
	Chatcolet – Visitor Center to Headquarters	\$854,462
	Chatcolet Northern Upper	\$420,758
	Rocky Point Boat Launch	\$124,830
Dust and Soil Stabilization with Grading		
	Benewah Campground	\$30,441
	Rocky Point Lodge and Parking Lot	\$14,594
	Hawley's Campsite	\$15,810
	Hawley's Lake View Road	\$18,804
	Chatcolet Campground	\$45,278
	Plummer Point	\$30,442
Chip Seal		
	Chatcolet Back Road	\$210,118
Total Phase II		\$3,059,779
Total		\$3,441,795

Appendix

- A. Heyburn State Park and Benewah Campground Roadway Map
- B. Coring Location Map
- C. Atterberg Test Results
- D. Modified Proctor Test Results
- E. CBR Test Results
- F. Cost Estimates

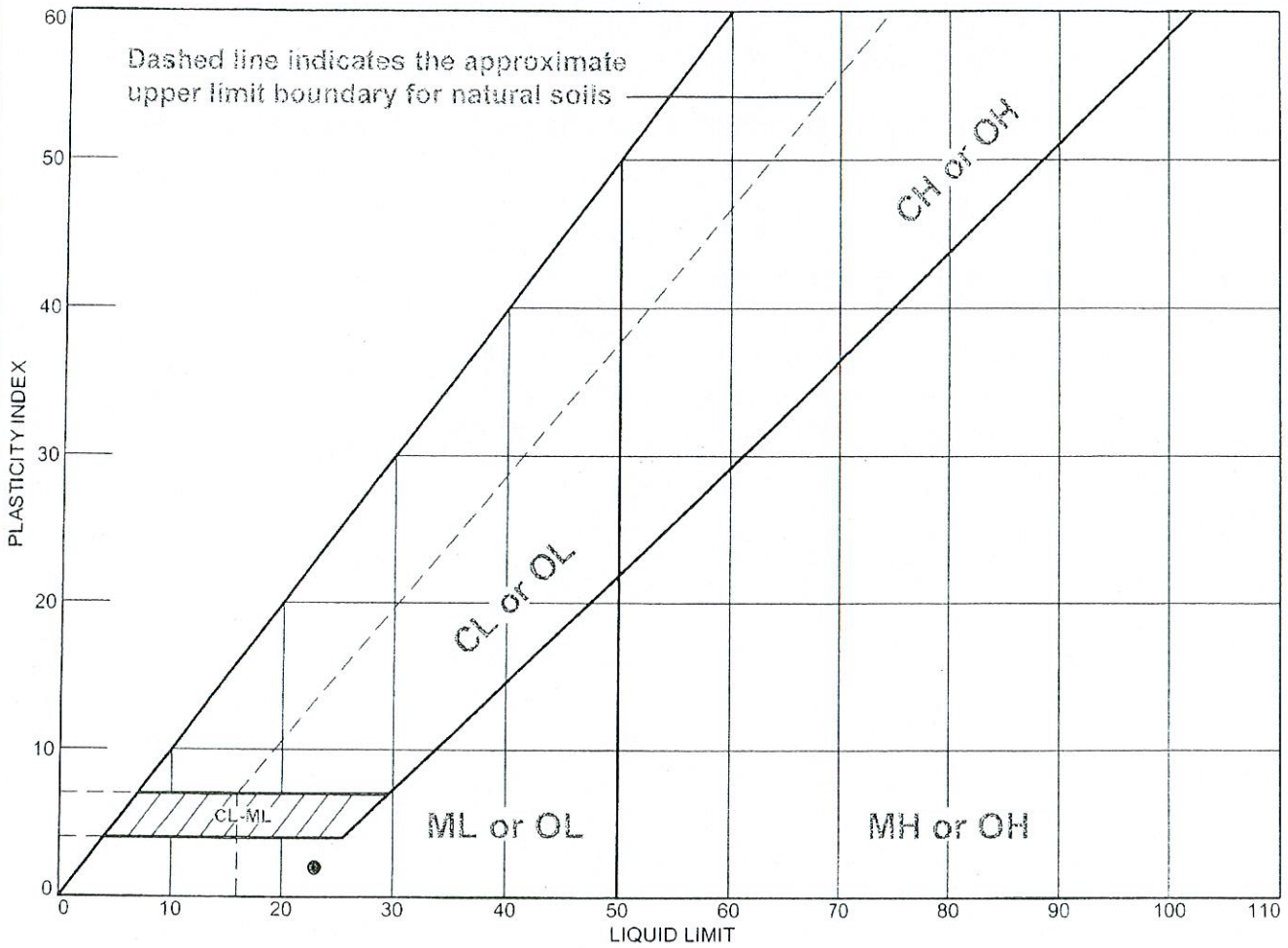


Heyburn State Park and Benewah Campground Roadway Map



Coring Location Map

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silt	23	21	2			ML

Project No. 108-200T Client: Welch Comer

Project: Heyburn Road Improvements

● Location: B-3 Depth: @ 1-3' Sample Number: S208-287

ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

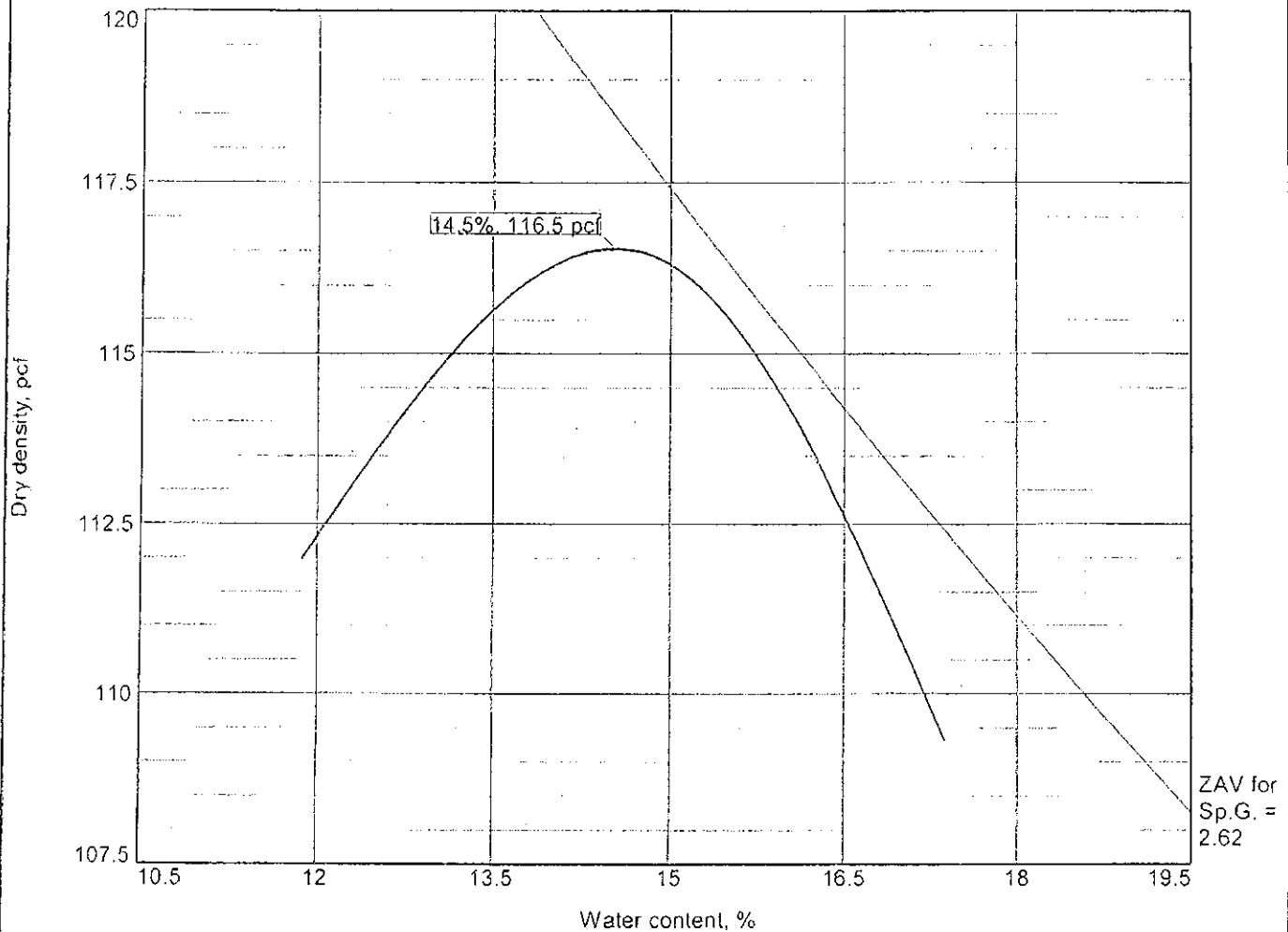
Remarks:

● ASTM D 4318

Reviewed by: DS


Tested By: B.Binsfield

COMPACTION TEST REPORT



Test specification: ASTM D 1557-00 Method A Modified

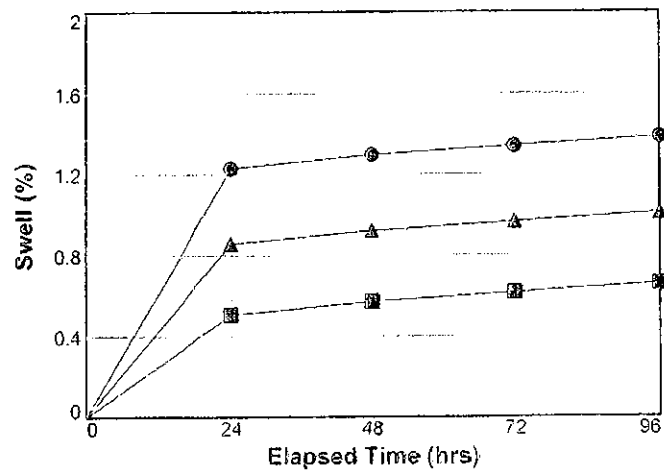
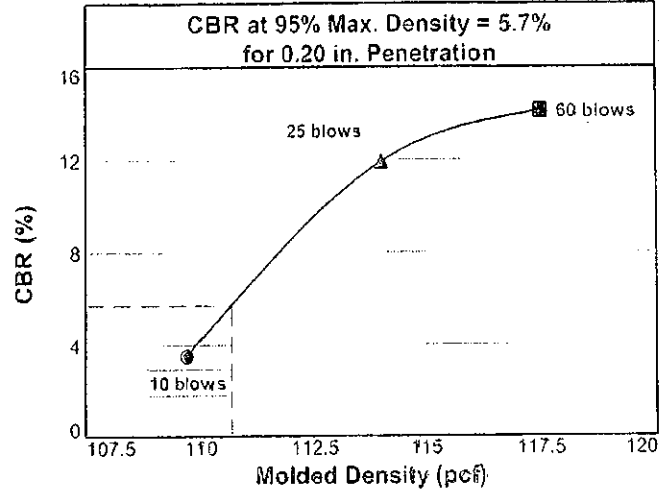
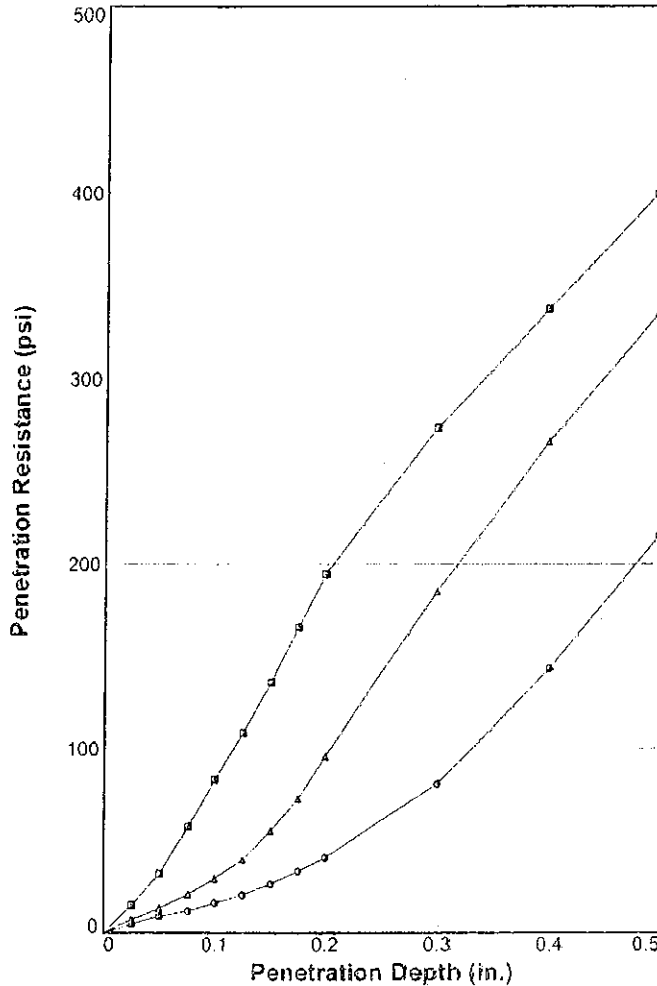
Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	Pl	% > #4	% < No.200
	USCS	AASHTO						
@ 1-3'	ML				23	2	0.0	

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 116.5 pcf		Silt
Optimum moisture = 14.5 %		
Project No. 108-200T Client: Welch Comer		Remarks: M.Rounds sampled 7-1-08
Project: Heyburn Road Improvements		
o Location: B-3 Depth: @ 1-3' Sample Number: S208-287		
ALLWEST TESTING & ENGINEERING, LLC		
Spokane, WA		Reviewed by: 

Tested By: Z.Rigby Checked By: D.Schmitz

BEARING RATIO TEST REPORT

ASTM D 1883-99



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ●	109.7	94.2	14.6	108.2	92.9	20.0	2.2	3.5	0.029	10	1.4
2 ▲	114.0	97.9	14.6	112.9	96.9	18.1	8.9	11.9	0.092	10	1
3 ■	117.5	100.9	14.6	116.8	100.2	16.1	10.5	14.1	0.022	10	0.7
Material Description							USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Silt							ML	116.5	14.5	23	2

Project No: 108-200T
Project: Heyburn Road Improvements
Location: B-3
Sample Number: S208-287 **Depth:** @ 1-3'
Date: 7-1-08

Test Description/Remarks:

BEARING RATIO TEST REPORT

ALLWEST TESTING & ENGINEERING, LLC

Reviewed by:

Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Intersection of Chatcolet Road and Chatcolet Upper Road
Reconstruct 200 feet of Chatcolet Upper Road - 20 ft Wide
3 Inches HMA Underlain by 12 inches of Base
ENGINEER's OPINION OF PRELIMINARY PROJECT COSTS

Prepared By: Megan Rounds, P.E.
Project Manager: Megan Rounds, P.E.

Date: April 7, 2009

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 4,500.00	\$ 4,500	
	Traffic Control	L.S.	1	\$ 2,000.00	\$ 2,000	
	Site Erosion Control	L.S.	1	\$ 5,000.00	\$ 5,000	
	Roadway Excavation	C.Y.	700	\$ 15.00	\$ 10,500	
	Structural Fill	C.Y.	1500	\$ 30.00	\$ 45,000	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	150	\$ 30.00	\$ 4,500	
	Hot Mix Asphalt	Tons	72.5	\$ 100.00	\$ 7,250	
	Asphalt Removal From Existing Roads	S.Y.	450	\$ 5.00	\$ 2,250	
	Striping (centerline and edge of pavement)	L.F.	600	\$ 1.50	\$ 900	
				\$ -	\$ -	
				\$ -	\$ -	
				Subtotal =	\$ 81,900	
				15% Contingency =	\$ 12,285	
				Total Estimated Construction =	\$ 94,185	\$ 212

ENGINEERING

Design Phase Services	\$ 8,700
Construction Phase Services	\$ 8,700

Estimated Total Project Cost in 2008 Dollars \$ 111,585

Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%) \$ 148,780

Assumptions:

Weight of asphalt is 145 pounds per cubic feet
Intersection reconstruction

**Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Intersection of Chatcolet Road and Plummer Point Road
Reconstruct 200 feet of Plummer Point Road - 14 feet Wide
Gravel Surface Roadway - 6 inches of Base
ENGINEER'S OPINION OF PRELIMINARY PROJECT COSTS**

Prepared By: Megan Rounds, P.E.

Date: April 7, 2009

Project Manager: Megan Rounds, P.E.

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 3,000.00	\$ 3,000	
	Traffic Control	L.S.	1	\$ 2,000.00	\$ 2,000	
	Site Erosion Control	L.S.	1	\$ 5,000.00	\$ 5,000	
	Roadway Excavation	C.Y.	500	\$ 15.00	\$ 7,500	
	Rock Removal	C.Y.	0	\$ 200.00	\$ -	
	Structural Fill	C.Y.	1000	\$ 30.00	\$ 30,000	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	52	\$ 30.00	\$ 1,560	
	Hot Mix Asphalt	Tons	0	\$ 100.00	\$ -	
	Asphalt Removal From Existing Roads	S.Y.	0	\$ 5.00	\$ -	
	Striping (centerline and edge of pavement)	L.F.	600	\$ 1.50	\$ 900	
Subtotal =					\$ 49,960	
15% Contingency =					\$ 7,494	
Total Estimated Construction =					\$ 57,454	\$ 185
ENGINEERING						
	Design Phase Services				\$ 5,800	
	Construction Phase Services				\$ 5,800	
	intersection reconstruction					
Estimated Total Project Cost in 2008 Dollars					\$ 69,054	
Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%)					\$ 92,072	
Assumptions:						

Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Intersection of SH-5 and Rocky Point Boat Launch Road
Realign 200 feet of Rocky Point Boat Launch Road - 14 feet Wide
2 inches of HMA Underlain by 6 Inches of Base
ENGINEER's OPINION OF PRELIMINARY PROJECT COSTS

Prepared By: Megan Rounds, P.E.
 Project Manager: Megan Rounds, P.E.

Date: April 7, 2009

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 4,500.00	\$ 4,500	
	Traffic Control	L.S.	1	\$ 2,000.00	\$ 2,000	
	Site Erosion Control	L.S.	1	\$ 5,000.00	\$ 5,000	
	Roadway Excavation	C.Y.	200	\$ 15.00	\$ 3,000	
	Rock Removal	C.Y.	0	\$ 200.00	\$ -	
	Geogrid	S.Y.	500	\$ 6.50	\$ 3,250	
	Structural Fill and Geogrid	C.Y.	1000	\$ 50.00	\$ 50,000	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	70	\$ 30.00	\$ 2,100	
	Hot Mix Asphalt	Tons	50.8	\$ 100.00	\$ 5,080	
	Asphalt Removal From Existing Roads	S.Y.	325	\$ 5.00	\$ 1,625	
	Striping (centerline and edge of pavement)	L.F.	600	\$ 1.50	\$ 900	

Subtotal = \$ 77,455
 15% Contingency = \$ 11,618
 Total Estimated Construction = \$ 89,073 \$ 286

ENGINEERING

Design Phase Services	\$ 8,400
Construction Phase Services	\$ 8,400

Estimated Total Project Cost in 2008 Dollars \$ 105,873

Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%) \$ 141,164

Assumptions:

Weight of asphalt is 145 pounds per cubic feet

**Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Chatcolet Road - 20 feet Wide
Full Width Reconstruction - Per 100 Feet
3 inches of Asphalt over 12 inches of Base
ENGINEER's OPINION OF PRELIMINARY PROJECT COSTS**

Prepared By: Megan Rounds, P.E.

Date:

April 7, 2009

Project Manager: Megan Rounds, P.E.

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 400.00	\$ 400	
	Traffic Control	L.S.	1	\$ 100.00	\$ 100	
	Site Erosion Control	L.S.	1	\$ 100.00	\$ 100	
	Roadway Excavation	C.Y.	100	\$ 15.00	\$ 1,500	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	75	\$ 30.00	\$ 2,250	
	Hot Mix Asphalt	Ton	36.3	\$ 100.00	\$ 3,625	
	Asphalt Removal From Existing Roads	S.Y.	225	\$ 5.00	\$ 1,125	
	Striping (centerline only)	L.F.	100	\$ 1.50	\$ 150	
Subtotal =					\$ 9,250	
15% Contingency =					\$ 1,388	
Total Estimated Construction =					\$ 10,638	\$ 48
ENGINEERING						
	Design Phase Services				\$ 750	
	Construction Phase Services				\$ 750	
Estimated Total Project Cost in 2008 Dollars					\$ 12,138	
Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%)					\$ 16,183	
Assumptions:						
Roadway is surfaced with asphalt						
Weight of asphalt is 145 pounds per cubic foot						

Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Road - 14 feet Wide
Full Width Reconstruction - Per 100 Feet
3 inches of Asphalt over 6 inches of Base
ENGINEER's OPINION OF PRELIMINARY PROJECT COSTS

Prepared By: Megan Rounds, P.E.

Date:

April 7, 2009

Project Manager: Megan Rounds, P.E.

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 400.00	\$ 400	
	Traffic Control	L.S.	1	\$ 100.00	\$ 100	
	Site Erosion Control	L.S.	1	\$ 100.00	\$ 100	
	Roadway Excavation	C.Y.	40	\$ 15.00	\$ 600	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	40	\$ 30.00	\$ 1,200	
	Hot Mix Asphalt	Ton	25.4	\$ 100.00	\$ 2,538	
	Asphalt Removal From Existing Roads	S.Y.	155	\$ 5.00	\$ 775	
	Striping (centerline only)	L.F.	100	\$ 1.50	\$ 150	
Subtotal =					\$ 5,863	
15% Contingency =					\$ 879	
Total Estimated Construction =					\$ 6,742	\$ 43

ENGINEERING

Design Phase Services	\$ 500
Construction Phase Services	\$ 500
Estimated Total Project Cost in 2008 Dollars	\$ 7,742
Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%)	\$ 10,323

Assumptions:

Existing roadway is surfaced with asphalt.
Weight of asphalt is 145 pounds per cubic foot
Remove existing asphalt
Excavate Roadway to grade
Place base and asphalt

Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Road - 14 feet Wide
Full Width Reconstruction - Per 100 Feet
3 inches of Asphalt, no base course

ENGINEER'S OPINION OF PRELIMINARY PROJECT COSTS

Prepared By: Megan Rounds, P.E.
 Project Manager: Megan Rounds, P.E.

Date: April 7, 2009

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 200.00	\$ 200	
	Traffic Control	L.S.	1	\$ 100.00	\$ 100	
	Site Erosion Control	L.S.	0	\$ 100.00	\$ -	
	Regrade and Reshape	S.Y.	156	\$ 10.00	\$ 1,556	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	0	\$ 30.00	\$ -	
	Hot Mix Asphalt	Ton	25.4	\$ 100.00	\$ 2,538	
	Asphalt Removal From Existing Roads	S.Y.	0	\$ 5.00	\$ -	
	Striping (centerline only)	L.F.	100	\$ 1.50	\$ 150	
Subtotal =					\$ 4,543	
15% Contingency =					\$ 681	
Total Estimated Construction =					\$ 5,225	\$ 34

ENGINEERING

Design Phase Services	\$ 100
Construction Phase Services	\$ 100

Estimated Total Project Cost in 2008 Dollars \$ 5,425

Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%) \$ 7,233

Assumptions:

Existing surface is gravel and is acceptable for base material.
 Weight of asphalt is 145 pounds per cubic foot.

**Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Chatcolet Road - 20 Feet Wide
Overlay - per 100 feet
2 inch Overlay**

ENGINEER's OPINION OF PRELIMINARY PROJECT COSTS

Prepared By: Megan Rounds, P.E.

Date: April 7, 2009

Project Manager: Megan Rounds, P.E.

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 200.00	\$ 200	
	Traffic Control	L.S.	1	\$ 100.00	\$ 100	
	Site Erosion Control	L.S.	0	\$ 100.00	\$ -	
	Roadway Excavation	C.Y.	0	\$ 15.00	\$ -	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	0	\$ 30.00	\$ -	
	Hot Mix Asphalt	Tons	24.2	\$ 100.00	\$ 2,417	
	Asphalt Removal by grinding	S.Y.	222.2	\$ 5.00	\$ 1,111	
	Striping (centerline only)	L.F.	100	\$ 1.50	\$ 150	
					\$ -	
				Subtotal =	\$ 3,978	
				15% Contingency =	\$ 597	
				Total Estimated Construction =	\$ 4,574	\$ 21

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Design Phase Services	\$ 300
Construction Phase Services	\$ 300

Estimated Total Project Cost in 2008 Dollars \$ 5,174

Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%) \$ 6,899

Assumptions:

Weight of asphalt is 145 pounds per cubic foot.
Existing base is acceptable and remaining pavement is acceptable.
Existing pavement is milled.

Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Double Shot Bituminous (Chip Seal)
Asphalt paved - 14 feet wide
14 feet wide - 100 feet long

ENGINEER'S OPINION OF PRELIMINARY PROJECT COSTS

Prepared By: Megan Rounds, P.E.

Date:

April 7, 2009

Project Manager: Megan Rounds, P.E.

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 200.00	\$ 200	
	Traffic Control	L.S.	1	\$ 100.00	\$ 100	
	Site Erosion Control	L.S.	0	\$ 100.00	\$ -	
	Roadway Excavation	C.Y.		\$ 15.00	\$ -	
	Subbase	C.Y.	0	\$ 15.00	\$ -	
	Base	C.Y.	5	\$ 30.00	\$ 150	
	Double Shot Bituminous Oil	S.Y.	160	\$ 8.00	\$ 1,280	
	Asphalt Removal From Existing Roads	S.Y.	0	\$ 5.00	\$ -	
	Striping	L.F.	0	\$ 1.50	\$ -	
Subtotal =					\$ 1,730	
15% Contingency =					\$ 260	
Total Estimated Construction =					\$ 1,990	\$ 13
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	Design Phase Services			\$	-	
	Construction Phase Services			\$	-	
Estimated Total Project Cost in 2008 Dollars					\$ 1,990	
Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%)					\$ 2,653	
Assumptions:						
1 inch of base rock is placed on the existing roadway.						
No material is removed from the existing roadway.						
Existing pavement is acceptable but surface is wearing.						
Chip seal placed on existing asphalt surface.						

**Heyburn State Park Road Improvements
Idaho Department of Parks and Recreation
Erosion/Dust Control Agent Soil Stabilizer**

14 feet Wide - 100 feet in Length

ENGINEER's OPINION OF PRELIMINARY PROJECT COSTS

Prepared By: Megan Rounds, P.E.

Date: April 7, 2009

Project Manager: Megan Rounds, P.E.

Segment	Description	Unit	Quantity	Unit Price	Total	Cost (per sq yd)
	Site Mobilization	L.S.	1	\$ 100.00	\$ 100	
	Traffic Control	L.S.	0	\$ -	\$ -	
	Site Erosion Control	L.S.	0	\$ -	\$ -	
	Regrade and Shape Roadway	S.Y.	160	\$ 2.00	\$ 320	
	Subbase	C.Y.	0	\$ -	\$ -	
	Base	C.Y.	0	\$ -	\$ -	
	Dust/Soil Erosion & Stabilization Control Agent	S.Y.	160	\$ 5.00	\$ 800	

Subtotal = \$ 1,220

15% Contingency = \$ 183

Total Estimated Construction = \$ 1,403 \$ 9

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Design Phase Services

\$ -

Construction Phase Services

\$ -

Estimated Total Project Cost in 2008 Dollars \$ 1,403

Estimated Total Future Dollar Cost in 2011 Dollars (Escalation Rate 4%) \$ 1,871

Assumptions:

Road must be regraded and shaped before applying.

Existing gravel surface is acceptable.